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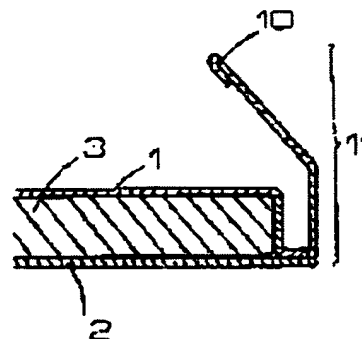
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## (54) DISPOSABLE DIAPER

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a disposable diaper which is effective for preventing leakage and stuffiness and where the quantity of a required material is reduced so that drastically reduce the cost.

**SOLUTION:** A side flap is formed by permitting a front surface sheet 1 to be extended from the longitudinal direction both side edges of an absorbing body 3 to an outside and also formed by providing a cut line from side flap both side edges to the neighborhood of an absorbing body side edge between a back side part and a crotch part in the side flap. The back side part side flap is arranged in a wide width state, the crotch part and belly side part side flap is folded inward in the neighborhood of the absorbing body, an extending/ contracting elastic body 10 is provided in an extending state in the side edge along the longitudinal direction, the longitudinal direction both side parts are adhered to the front surface sheet 1 and solid gathers 11 are formed.



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CLAIMS

[Claim(s)]

[Claim 1] The surface sheet of liquid permeability, the rear-face sheet of liquid impermeability, and the absorber arranged among both [ these ] sheets, In the usage \*\*\*\* diaper which has the solid gathers currently formed the side flap formed when a surface sheet extends outside from the longitudinal direction edges on both sides of an absorber, and near the edges on both sides of an absorber A back side flap is formed by forming the slitting line attained near the absorber side edge from side flap edges on both sides on a surface sheet between the side flaps of the back and the length-from-the-crotch-to-the-cuff section. It is arranged in the double-width condition and the side flap of the length-from-the-crotch-to-the-cuff section and an antinode flank is turned up inside near the absorber. It is the usage \*\*\*\* diaper characterized by for an elasticity elastic body being arranged in the state of expanding by the side edge in alignment with the longitudinal direction, pasting up the longitudinal direction both ends on a surface sheet, and forming solid gathers.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] About a usage \*\*\*\* diaper, this invention is effective for leakage and MURE prevention, and relates to the usage \*\*\*\* diaper which can plan large cost reduction.

[0002]

[Description of the Prior Art] The usage \*\*\*\* diaper has composition which has arranged the absorber which consists of hydrophilic sheet, curdy pulp, and super-absorbent polymer matter etc. between the surface sheet of liquid permeability, and a liquid impermeable rear-face sheet. Greatest effectiveness was to be obtained to leakage, reversion, etc. of urine, a loose passage, etc., since it comes to use the super-absorbent polymer matter into the absorber of a disposable diaper in recent years. However, the super-absorbent polymer matter may leak, when urine, a loose passage, etc. are excreted temporarily, since urinary rate of absorption is extremely slow compared with curdy pulp. For this reason, a cure which does not leak to a lot of urine or loose passages is needed.

[0003] In order to solve these points, arranging solid gathers on the outside of an absorber has been proposed. That is, the solid gathers which have a side flap containing an elasticity elastic body in JP,6-93901,B, and function on it as the leakproof section are pushed down and installed inside a diaper including an elasticity elastic body, the pocket section is formed between the surface sheets on an absorber, and the diaper which aimed at leakage prevention is known. However, although effectiveness is in leakage prevention, since another material which is different from a surface sheet in order to form solid gathers is needed, a surface sheet stops being [ many ] needed and a manufacturing cost goes up the diaper represented by this. Moreover, since the side flap is excised in order for most diapers generally known to narrow width of face of the length-from-the-crotch-to-the-cuff section a sake [ on the fit disposition of length from the crotch to the cuff ], a material becomes useless. Moreover, a side flap is the bank, MURE which becomes empty, and a cone, without absorbing sweat, since a rear-face sheet and a surface sheet are stuck and the absorber is not arranged at the surface sheet bottom. Furthermore, at the time of wearing, in a wearer's \*\*\*\*, since the side flap of an antinode flank and the back laps, MURE produces it more. Although the well-known moisture permeability film may be used for a rear-face sheet as MURE prevention, slight effectiveness remains for accepting.

[0004]

[Problem(s) to be Solved by the Invention] In view of this situation, as for this invention person etc., a side flap is formed from a surface sheet. The slitting line furthermore attained near the absorber side edge from side flap edges on both sides between the side flaps of the back and the length-from-the-crotch-to-the-cuff section is formed. It is effective for leakage and MURE prevention, the amount of materials which is needed for manufacture decreased, and the usage \*\*\*\* diaper which has the solid gathers by which the side flap of the length-from-the-crotch-to-the-cuff section and an antinode flank is turned up and formed inside found out that large cost reduction could be planned. The purpose of this invention is effective for leakage and MURE prevention, and is to offer the usage \*\*\*\* diaper which can plan still larger cost reduction.

[0005]

[Means for Solving the Problem] The absorber with which this invention has been arranged between the surface sheet of liquid permeability, the rear-face sheet of liquid impermeability, and both [ these ] sheets, In the usage \*\*\*\* diaper which has the solid gathers currently formed the side flap formed when a surface sheet extends outside from the longitudinal direction edges on both sides of an absorber, and near the edges on both sides of an absorber A back side flap is formed by forming the slitting line attained near the absorber side edge from side flap edges on both sides on a surface sheet between the side flaps of the back and the length-from-the-crotch-to-the-cuff section. It is arranged in the double-width condition and the side flap of the length-from-the-crotch-to-the-cuff section and an antinode flank is turned up inside near the absorber. An elasticity elastic body is arranged in the state of expanding by the side edge in alignment with the longitudinal direction, the longitudinal direction both ends are pasted up on a surface sheet, and it consists in the usage \*\*\*\* diaper characterized by forming solid gathers.

[0006]

[Embodiment of the Invention] The nonwoven fabric of liquid permeability with which the surface sheet used in this invention consists of polyester, polypropylene, etc., and textile fabrics are used. Moreover, a natural fiber is sufficient and it can manufacture from the ingredient of large range, such as combination of a synthetic fiber and a natural fiber. Anyway, since a surface sheet is a part in contact with the direct skin, it is soft, the touch should be just good, and it should just be permeability. Since the central field of a surface sheet is arranged on an absorber, it is desirable that it is hydrophilic fiber so that liquid can be made to penetrate promptly. Moreover, as for the lengthwise direction both-ends field of a surface sheet, it is desirable that it is water repellence as it does not ooze out outside from the absorber which absorbed liquid. Moreover, a surface sheet does not need to consist of single sheets and may consist of sheets of two or more sheets, such as a center-section surface sheet and a flank surface sheet. Moreover, in case a surface sheet is constituted from a sheet of two or more sheets, although each sheet may use another material, the same material is sufficient as it.

[0007] The rear-face sheet used in this invention consists of a material which has stuck a nonwoven fabric or textile fabrics on liquid impermeable films, such as polyethylene, and a liquid impermeable film, there is especially no limit and the moisture in an absorber should not just ooze out on the diaper outside. Moreover, in order to give a blanket-like appearance, embossing processing may be carried out at the shape of a pattern, or lusterless finishing may be carried out further. Moreover, when using a film, though it is impermeability, it is desirable from using the well-known moisture permeability film which makes only a steam penetrate, and preventing MURE.

[0008] The absorber used in this invention is formed with the curdy pulp and super-absorbent polymer matter, a hydrophilic sheet, etc., and especially if it has the property of absorptivity, it will not receive a limit. The absorber used in this invention is made from the well-known absorptivity ingredient with which the absorptivity goods of a conventional usage \*\*\*\* diaper and conventional others are usually used. That is, it is formed from the monolayer or the multilayer mat which consists of absorptivity fiber, such as curdy pulp and rayon, and is further covered with the hydrophilic sheet, and the super-absorbent polymer matter is arranged in each mat at homogeneity, and is arranged in the shape of a layer between mixing or each mat. Moreover, after the absorber mixed by homogeneity in the super-absorbent polymer matter mixes 3 - 60% of the weight of the heat welding nature matter to curdy pulp, thermocompression bonding may be carried out or only the super-absorbent polymer matter may be covered with the hydrophilic sheet.

[0009] It is a thing with a fiber length of 5mm or less obtained as curdy pulp by \*\*\*\*(ing) a chemical pulp sheet, a recycled pulp sheet, and a mechanical pulp sheet with a grinder. As a pulp raw material, not only a needle-leaf tree but a broad-leaved tree, straw, a bamboo, and a kenaf are applied. Although the amount of this pulp used differs by whether it uses independently for example, or two or more laminatings are carried out and it uses with the target absorber, or other absorbers are used together, generally it is 50 - 400 g/m<sup>2</sup>.

[0010] As super-absorbent polymer matter, a starch system, a cellulose system, and a synthetic polymer system are raised. Namely, the saponification object of a starch-acrylic-acid (salt) graft polymer and a starch-ethyl-acrylate graft copolymer. The saponification object of a starch-METAKURU acid methyl graft copolymer, the saponification object of a starch-acrylonitrile graft copolymer, The saponification object of a starch-acrylamide graft copolymer, the saponification object of a starch-acrylonitrile-2-acrylamido-2-methyl-propane-sulfonic-acid graft copolymer. They are the polyethylene oxide over which the bridge was constructed with the acrylic-acid (salt) polymer and the acrylic acid, the bridge formation object of a sodium carboxymethyl cellulose, a polyvinyl alcohol-maleic-anhydride reactant bridge formation object, etc.

[0011] The urine, the body fluid, and water of 20 times or more of a self-weight are absorbed, and the thing of a sodium polyacrylate system is the most suitable from the point of absorptivity ability. the curdy pulp 100 weight section which dried the amount of distribution of the super-absorbent polymer matter -- receiving -- the 10 - 500 weight section -- it is the 15 - 300 weight section preferably, and the super-absorbent polymer matter of this amount is substantially distributed over curdy pulp at homogeneity. When the super-absorbent polymer matter absorbed water and swells, a mutual interference can minimize the particle and it contacts continuously, and there are few permeability barriers and they carry out transparency water absorption of urine or the body fluid in the direction of a three dimension.

[0012] The configurations of the absorber used for this invention should just be configurations in which there is especially no limit and length from the crotch to the cuff is fitted, such as a sandglass mold, a \*\* type, and a T character mold. In order to raise a feeling of wear generally, it is desirable that it is especially the configuration which narrowed the length-from-the-crotch-to-the-cuff sections, such as a sandglass mold and a T character mold.

[0013]

[Example] Although an example is given to below and the usage \*\*\*\* diaper of this invention is more concretely explained to it, of course, this invention is not limited by these. Drawing 1 shows the expansion perspective view of the usage \*\*\*\* diaper of this invention, and drawing 2 shows the top view of a usage \*\*\*\* diaper, and is. Drawing 3 shows the x-x' line sectional view in drawing 2, i.e., the sectional view of the length-from-the-crotch-to-the-cuff section of a diaper. Drawing 4 shows the y-y' line sectional view in drawing 2, i.e., the sectional view of the back of a diaper. Drawing 5 shows the z-z' line sectional view in drawing 2, i.e., the sectional view of the antinode flank of a diaper. Drawing 6 is \*\*\*\*\* which shows the x-x' line sectional view in drawing 2, i.e., the sectional view of the length-from-the-crotch-to-the-cuff section of a diaper, and indicates another example to be drawing 3.

[0014] moreover, the sign 1 -- a liquid permeability surface sheet (it may be called a surface sheet below) and 2 -- a liquid impermeable rear-face sheet (it may be called a rear-face sheet below) and 3 -- an absorber and 4 -- a tape fastener and 5 -- a side flap and 6 -- the back and 7 -- the length-from-the-crotch-to-the-cuff section and 8 -- in an antinode flank and 9, solid gathers and 12 show the circumference gathers of a foot, and, as for a slitting line and 10, 13 show the adhesion field, as for an elasticity elastic body and 11

[0015] As shown in drawing 1 - drawing 5, the structure of the usage \*\*\*\* diaper of this invention has an absorber 3 the surface sheet 1, the rear-face sheet 2, and in the meantime, and has the side flap 5 which extended outside from the longitudinal direction edges on both sides of an absorber 3. The longitudinal direction die length of the rear-face sheet 2 is longer than an absorber 3, and should just be the magnitude which can cover the whole absorber 3 inferior surface of tongue at least. Moreover, the side flap 5 is formed when the surface sheet 1 extends outside from the longitudinal direction edges on both sides of an absorber 3. That is, the longitudinal direction die length of the surface sheet 1 which forms the side flap 5 is longer than the rear-face sheet 2.

[0016] As for the usage \*\*\*\* diaper of this invention, three fields, the back 6, the length-from-the-crotch-to-the-cuff section 7, and the antinode flank 8, exist. The back 6 is a field in contact with a wearer's back, the length-from-the-crotch-to-the-cuff section 7 is a field in contact with length from the crotch to the cuff, and the antinode flank 8 is a field in contact with an antinode. The slitting line 9 attained near the absorber 3 side edge from side flap 5 edges on both sides between the side flaps 5 of the back 6 and the length-from-the-crotch-to-the-cuff section 7 is formed. Although a straight line is sufficient as the slitting line 9, it is desirable that they are a curve or an arc line as a foot is fitted. The side flap 5 of the back 6 is arranged in the double-width condition, and the tape fastener 4 is attached in the side edge, and it is used at the time of diaper wear.

[0017] The side flap 5 of the length-from-the-crotch-to-the-cuff section 7 and the antinode flank 8 is turned up inside with about three absorber. By being bent, the elasticity elastic body 10 of an expanding condition is wrapped in inside, and the side edge in alignment with the longitudinal direction of the side flap 5 furthermore turned up is formed in saccate. Although an elastomer film, a polyurethane film, natural-rubber-silk rubber, urethane yarn rubber, Taira rubber, a heat shrink nature film, etc. are used as an elasticity elastic body 10, it will not be limited especially if it is an elastic material. Several [ of at least one elasticity elastic body 10 arranged in the side flap 5 ] may be arranged. Moreover, as for the elasticity elastic body 10, to the antinode flank 8, not being arranged is [ that the die length of the elasticity elastic body 10 in the side flap 5 should just be more than wrap die length about length-from-the-crotch-to-the-cuff section 7 field ] desirable. Since the antinode flank 8 is a part in contact with a direct wearer's body, when the elasticity elastic body 10 is arranged and it contracts, it will be remarkably inferior in a feeling of wear.

[0018] As for the longitudinal direction both ends of the side flap 5 of the turned-up length-from-the-crotch-to-the-cuff section 7 and the antinode flank 8, the adhesion field 13 is formed on the surface sheet 1, and both are being fixed firmly. The adhesion approach can consider hot melt adhesive, adhesion by heat, ultrasonic bonding, etc., and there is especially no limit. Consequently, with contraction of the elasticity elastic body 10 currently arranged into the side flap 5, the side flap 5 of the length-from-the-crotch-to-the-cuff section 7 stands up up, and the solid gathers 11 are formed. As the fixed approach of the solid gathers 11, as long as it is independent or the approaches that

it does not peel even if it gets wet in urine etc. although there is an approach by such combination, such as an approach by hot melt adhesive, a heat-sealing joining method, and an ultrasonic welding method, which approach may be used.

[0019] Moreover, as shown in drawing 6, in order to raise fit nature, the elasticity elastic body 10 may be arranged near the absorber 3 side edge, and the circumference gathers 12 of a foot may be formed. As for the elasticity elastic body 10 which forms the circumference gathers 12 of a foot, it is desirable to arrange so that it may be possible to consist of several lines which are not parallel to one line or mutual or parallel, or to consider as a curve and a crotch may fit.

[0020] Since the surface sheet 1 and the rear-face sheet 2 stick, and the side flap 5 is put together and formed, MURE produces the usage \*\*\*\* diaper generally known. Generally the rear-face sheet 2 which is liquid impermeability is a film-like, and MURE tends to produce it rather than the surface sheet 1. For this reason, it is effective for MURE prevention that the side flap 5 is formed only with the surface sheet 1 like the diaper of this invention. Since the side flap 5 of the antinode flank 8 is furthermore turned up inside, only the side flap 5 of the back 6 formed with the surface sheet 1 will exist in a wearer's flank at the time of wearing. For this reason, the humidity which rose within the diaper at the time of wear is discharged outside from the side flap 5 of the back 6 which exists in a wearer's flank. So, greatest effectiveness can be raised to MURE. Moreover, since the side flap 5 is excised in order that a usage \*\*\*\* diaper may narrow width of face of the length-from-the-crotch-to-the-cuff section 7 a sake [ on the fit disposition of length from the crotch to the cuff ], the material is usually useless. Since the diaper of this point this invention forms the solid gathers 11 in the part of the side flap 5 originally excised, a needed material is few-quantified. Furthermore, since only wrap magnitude is arranged in the whole inferior surface of tongue of an absorber 3, a required material is few-quantified and the diaper manufacture by low cost is more possible for the rear-face sheet 2 than a common diaper.

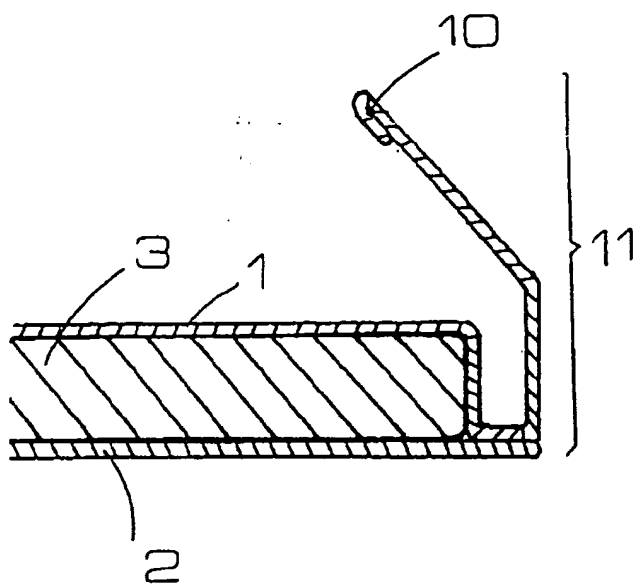
[0021]

[Effect of the Invention] As explained above, since the side flap of the back is formed from a surface sheet, the side flap of an antinode flank is turned up further inside and only the side flap of the back exists in a wearer's flank, the usage \*\*\*\* diaper of this invention is effective for MURE prevention. Moreover, since it has the solid gathers by which the side flap of the length-from-the-crotch-to-the-cuff section and an antinode flank is turned up and formed inside and a rear-face sheet is also arranged at the lower chisel of an absorber, it is effective for leakage, and also the amount of materials required for manufacture is few-quantified, and can plan large cost reduction.

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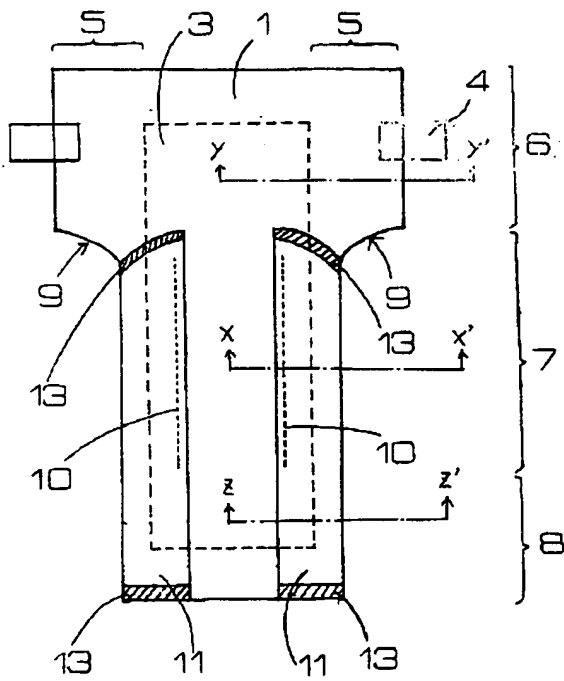
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Drawing selection Representative drawing



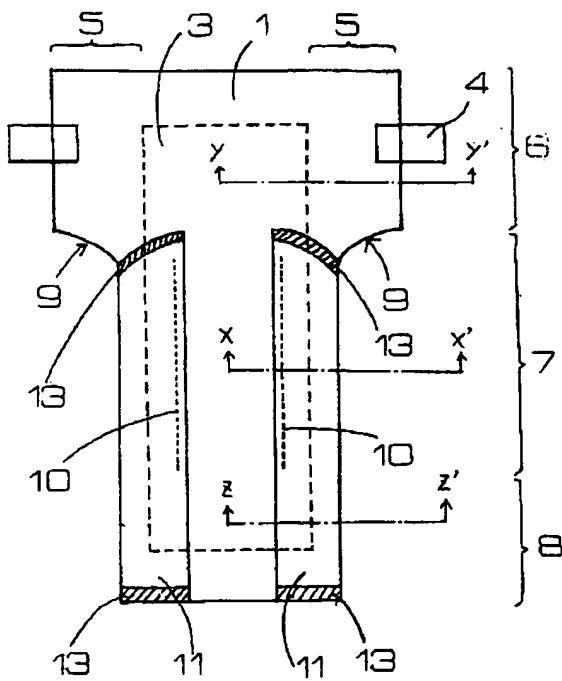
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Drawing selection drawing 2



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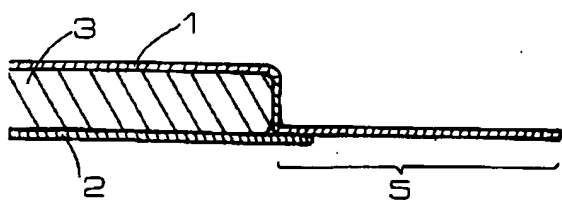
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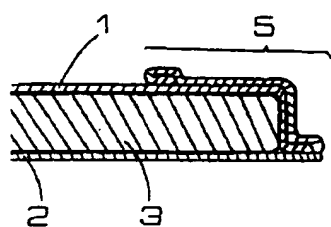


Drawing selection drawing 4



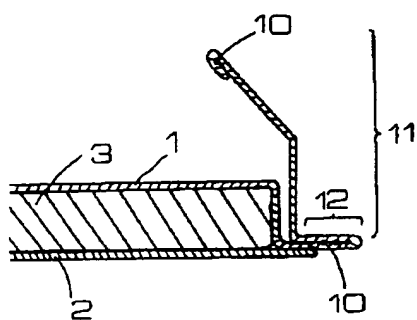
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Drawing selection drawing 5



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Drawing selection drawing 6



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